EX PARTE OR LATE FILED

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June 13, 1997

Mr. William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

EX PARTE: Access Reform (CC Docket 96-262) Usage of the Public Switched Network by Information Service Providers (CC Docket 92-263)

Dear Mr. Caton:

Today, representatives of GTE met with Kevin Werbach and Andrew Mar of the Office of Plans and Policy, William Bailey, Paul D'Ari, Pat Donovan, and Belinda Nixon of the Common Carrier Bureau to discuss comments submitted by GTE in the above captioned proceedings. The results of a study conducted by Hewlett Packard on ISP network usage in GTE's Tampa, FL serving area was reviewed in the meeting. Attached is a copy of the Tampa study as well as other materials used to augment the discussion.

Please call me on (202) 463-5293 if you have any questions.

Sincerely,

W. Scott Randolph
Director - Regulatory Matters

Attachments

c: William Bailey
Paul D'Ari
Pat Donovan
Andrew Mar
Belinda Nixon
Kevin Werbach

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HEWLETT PACKARD

AcceSS7 Network Study

Internet Service Provider

Prepared for: GTE Telops
April 30, 1997

Prepared by: Jim Baker
Hewlett-Packard

Study Period: **April 13 - 19, 1997**

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EXECUTIVE SUMMARY

The activity of Internet Service Providers (ISP's) providing dial-up access to the Internet has caused concern over the required resource demands on the local telephone network. These ISP's typically provide service at a flat monthly rate for unlimited access.

The recent growth of several of the large ISP's prompted GTE to study in more detail the calling patterns of these service companies and how they may differ from the normal patterns for which the network was engineered. In the some cases, ISP's have advertised a mass event, such a "chat with a celebrity", creating a mass calling for the local telephone network with 10,000+ calls to a single ISP within several hours.

The purpose of this study was to determine an estimate of the call volume and resource usage by these ISP's. The estimate was made using the Hewlett-Packard SS7 monitoring system, AcceSS7, to measure all calls terminating to GTE offices in part of Tampa, Florida where a number of ISP's have service. Using the data from each call, further data analysis was performed to create hourly and daily trend reports.

Data was collected for an exact one-week period, including weekend and weekday traffic.

Of particular interest were not only the number of call attempts but also the percentage of line usage of ISP's over all other calls. As well, daily and hourly trending information of these values was desired.

The report found a substantial amount of ISP traffic compared to other traffic. On weekend days, ISP line usage exceeded that for all other calls combined. For weekdays, the ISP line usage only exceeded other calls during late night and early morning hours.

In particular, the line resources consumed by the ISP's indicate significantly longer call durations. As well, the daily and hourly trend shows that the ISP's promote different usage patterns than that of normal calls.

DATA COLLECTION

The installed AcceSS7 equipment monitored and recorded all terminating calls to three specified end offices in the Tampa, Florida LATA:

Ybor City	YBCTFLXA24H	240-149-21
Tampa East	TAMPFLXEDS0	240-149-85
Tampa Main	TAMPFLXX27H	240-149-23

NETWORK TOPOLOGY FOR STUDY

In Tampa, Florida, a number of ISP's were selected that had service from one of three Central Office locations.

These offices were connected to the GTE SS7 network by the Tampa and Clearwater pair of Signaling Transfer Points (STP's) as shown below. Nearly[1] all calls into these offices have call setup data on these SS7 links which contains all needed information including call origin, destination, and duration.

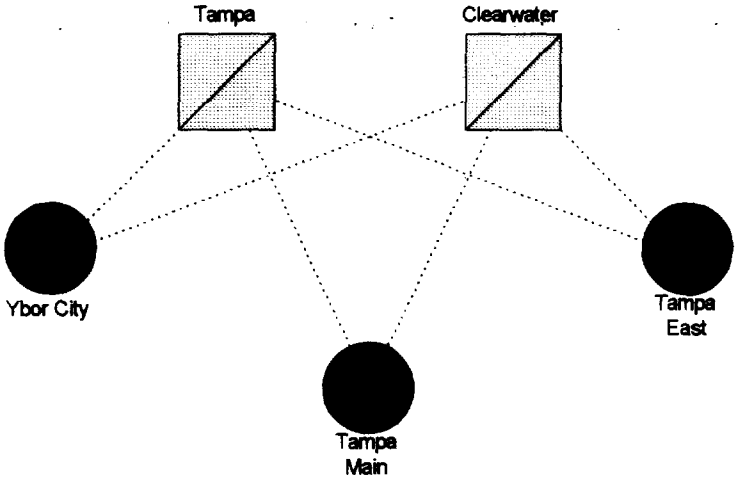


Figure 1 – SS7 Network for Tampa Study

Each of these offices have trunk and line interfaces. The trunk (network side) interfaces connect each office to other offices in the GTE network. The line (subscriber side) interfaces provide dial-tone to customers.

Since the study includes all terminating phone calls, the results could apply to both sides, depending on the resource being engineeed.

[1] This would not include calls that are completed using inbound signaling (MF trunks), such as Operator assisted or Pay Phone.

SCOPE OF STUDY

This study was performed during a complete, seven-day week from April 13 through April 19, 1997.

Data from all terminating calls to three offices were collected.

Location	CLLI	Point Code
Ybor City	YBCTFLXA24H	240-149-21
Tampa East	TAMPFLXEDS0	240-149-85
Tampa Main	TAMPFLXX27H	240-149-23

GTE provided a list of 18 ISP's terminating numbers. All other calls were considered to be "non-ISP", although it is likely that other numbers were providing unrecognized ISP service as well.

ACCESS7 IMPLEMENTATION

With the cooperation and assistance of the Tampa and Clearwater GTE personnel, Hewlett-Packard installed the AcceSS7 monitoring system at the two STP locations in Tampa Florida.

This allowed for complete, yet non-intrusive, access to the SS7 links to the specified central offices.

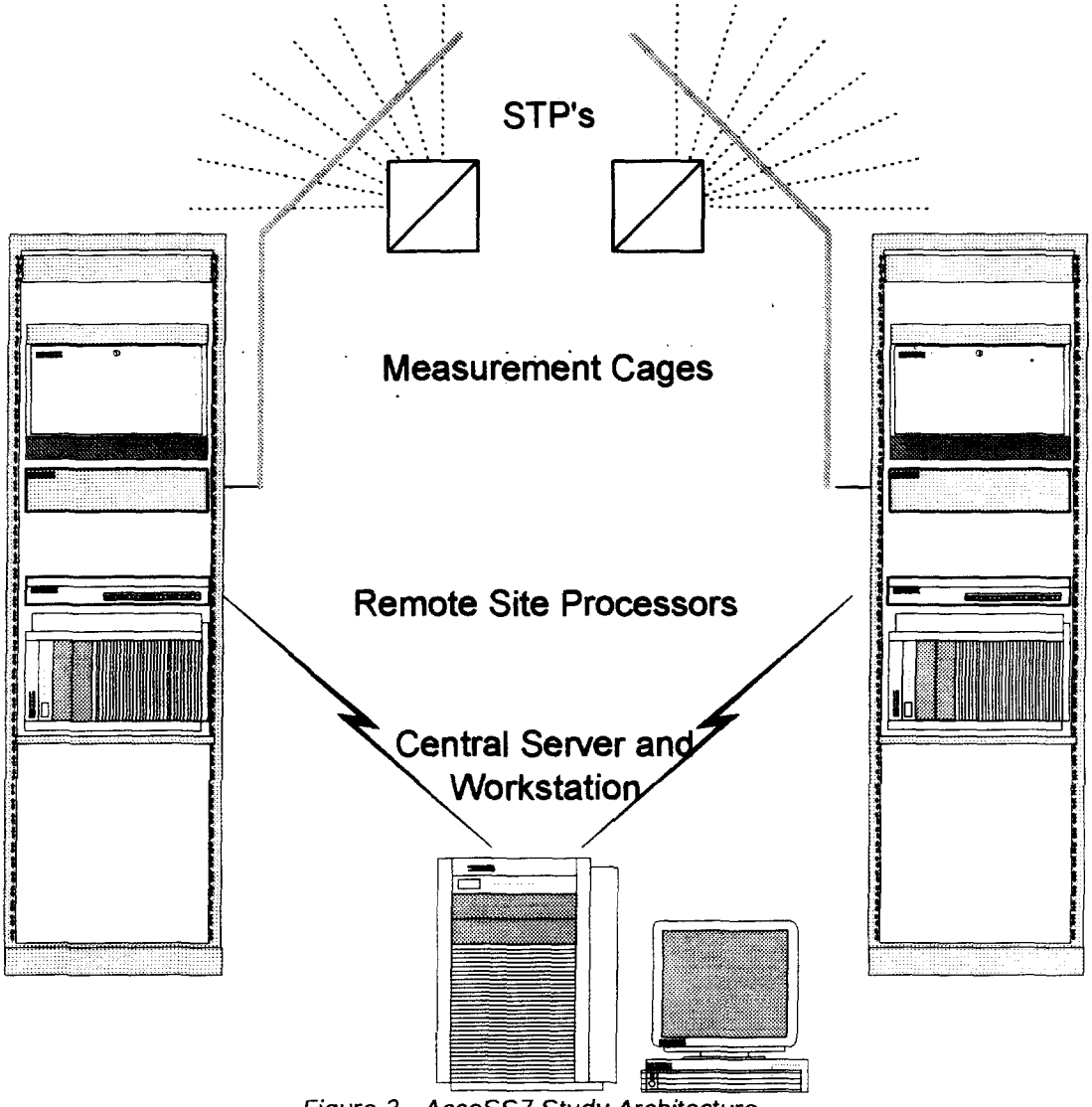


Figure 2 - AcceSS7 Study Architecture

A collection of hardware and software was deployed including:

- Measurement Card Cages
- Remote Site Processors
- Central Server
- Analysis Workstation

The previous diagram shows how the AcceSS7 system components were deployed to monitor the SS7 links and transmit the data back to the central server and workstation for analysis.

The data for each call was maintained on disk and used by analysis routines executed on the workstation. The results were then gathered remotely for this report as well as transmitted to GTE for daily reports.

OFFICE TRAFFIC

WEEKLY CALL VOLUME

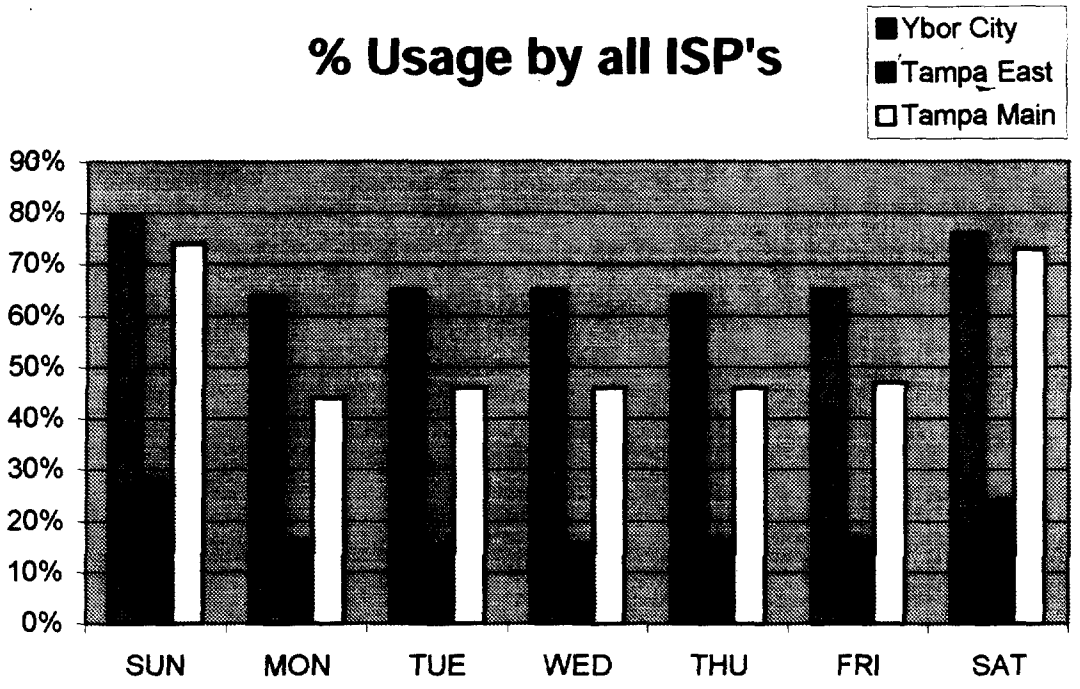
Each day, several statistics were collected for each office showing the number of phone calls and % line usage. The table below shows the total values for the entire week.

Location	Total Calls / Average %Usage
Ybor City	
Non-ISP Calls:	**1,123,389**
ISP Calls:	**353,035**
Non-ISP % Usage:	**32%**
ISP % Usage:	**68%**
Tampa East	
Non-ISP Calls:	**5,597,352**
ISP Calls:	**84,659**
Non-ISP % Usage:	**81%**
ISP % Usage:	**19%**
Tampa Main	
Non-ISP Calls:	**1,353,175**
ISP Calls:	**205,754**
Non-ISP % Usage:	**46%**
ISP % Usage:	**54%**

DAILY % USAGE

Percentage usage values are calculated as a percentage of ISP line usage over total line usage for all calls. Unanswered calls have zero usage.

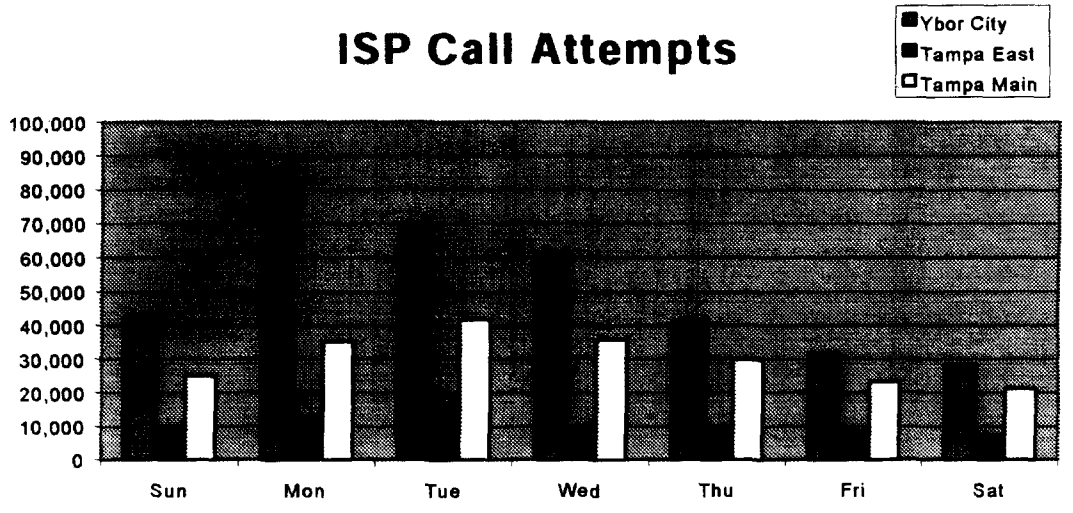
Note that these values do not show the % usage based on switch capacity, but only compared to other switch usage during that day.



DAILY CALLS TO ISP'S

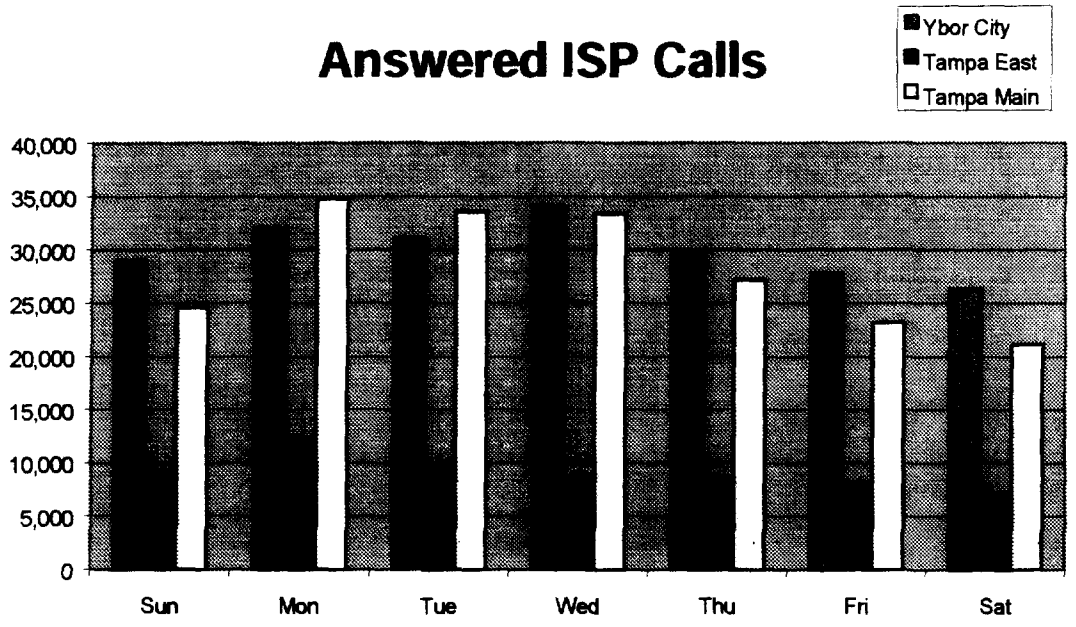
Call attempts are based on the count of ISUP Initial Address Messages (IAM's) to the central office, regardless of whether the calls were answered or busy.

All ISP numbers are included in the values below, grouped by the end-office that serves them.



The following chart shows the number of answered calls each day on each end office.

All ISP numbers are included in the values below, grouped by the end-office that serves them.



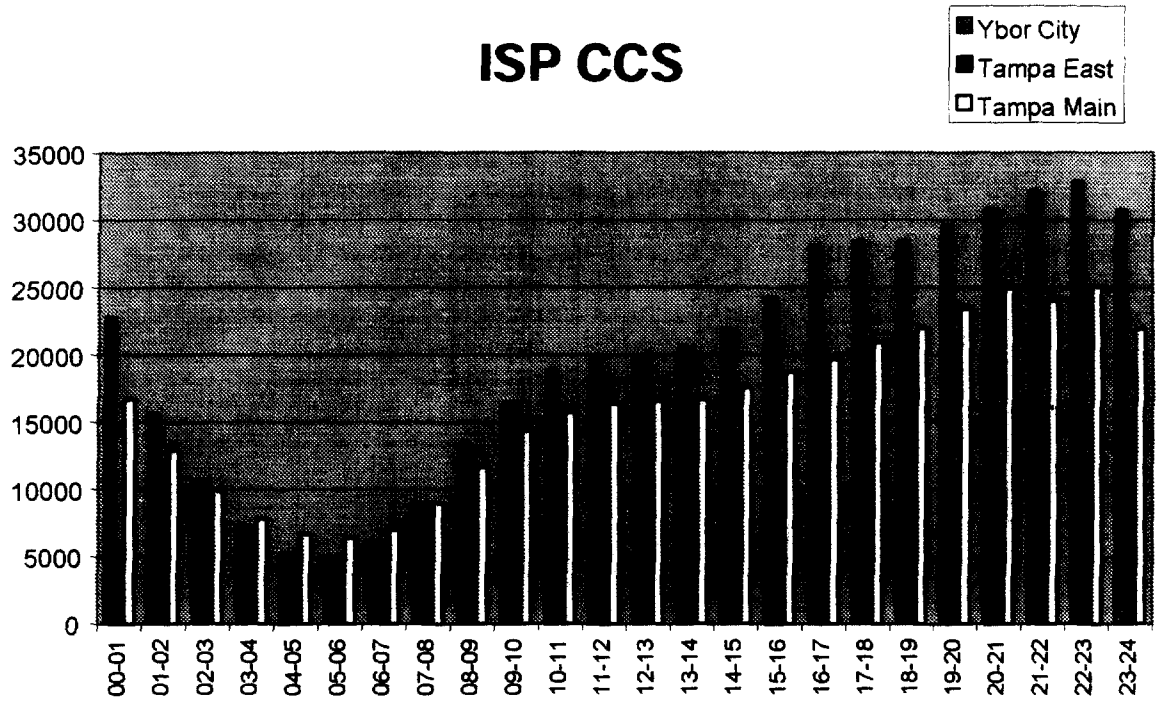
Non-ISP calls were shown to be around 70-75% completed, with the remainder as unanswered or busy. However, the percentage of answered calls to ISP's are significantly lower.

In particular, the Ybor City end office has far more call attempts than that of the other offices - nearly half of the calls to the Ybor City ISP's are not answered. This would indicate the Ybor City ISP's have insufficient resources to answer calls successfully.

HOURLY OFFICE TRENDS

The chart below shows the average total line usage per office in each hour. The average is calculated from each hour period during the seven-day study.

All ISP numbers are included in the values below, grouped by the end-office that serves them.



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ISP AND NON-ISP COMPARISON

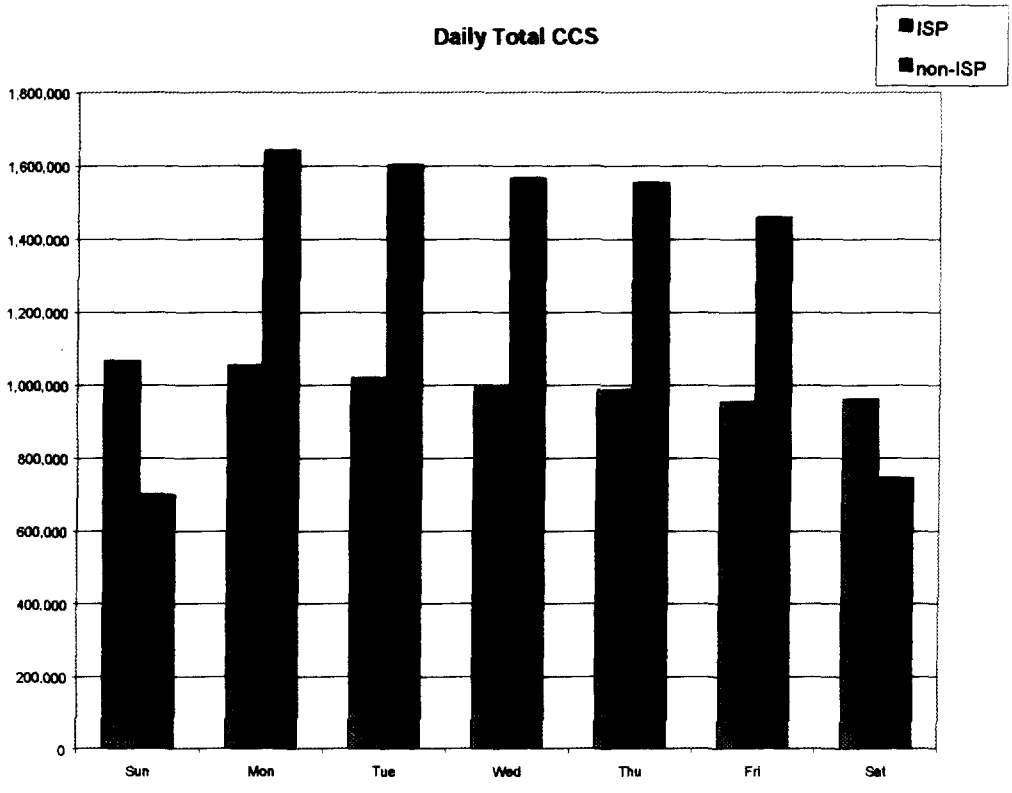
DAILY TRENDS

Call Attempts

Day	non-ISP Calls:	ISP Calls:
SUN	58,0126	76,907
MON	1,408,725	133,974
TUE	1,448,822	127,290
WED	1,415,840	105,687
THU	1,346,651	79,548
FRI	1,219,484	63,453
SAT	654,268	56,589
Total	8,073,916	643,448

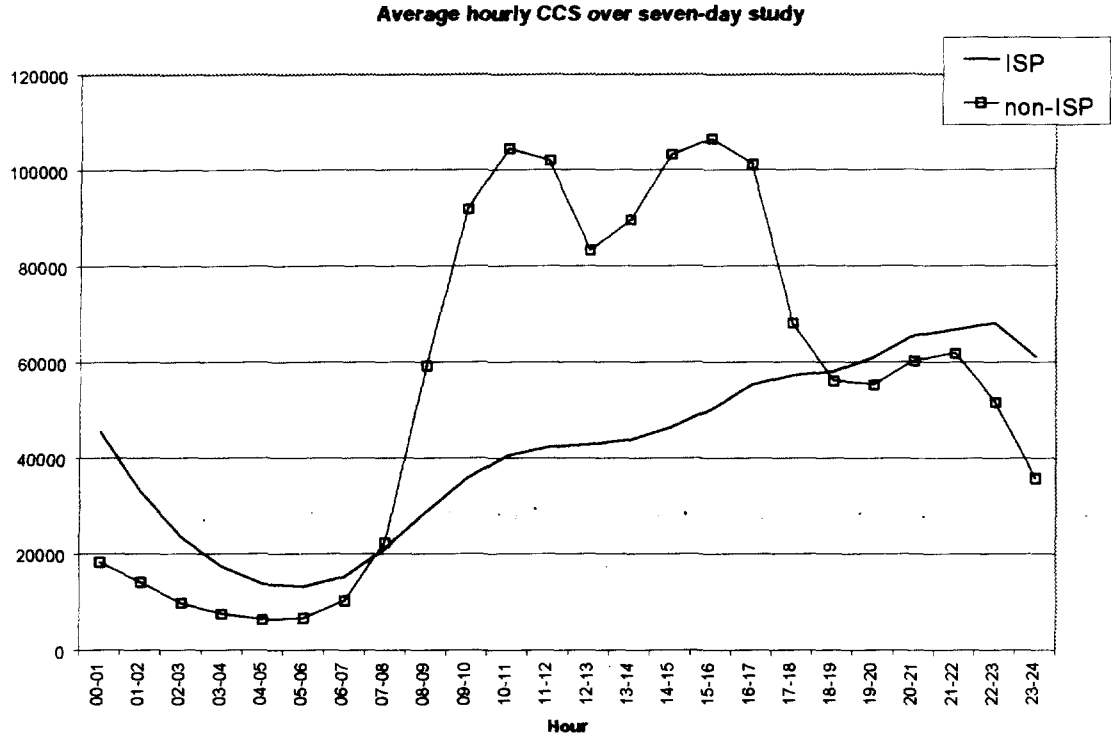
Usage

The following chart shows that ISP CCS actually exceeds non-ISP volume during weekend days.



HOURLY TRENDS

The following chart shows that ISP CCS actually exceeds non-ISP volume during off-peak hours. In addition, there is a steady increase in ISP usage during the day while the non-ISP usage is rapidly increasing as well.



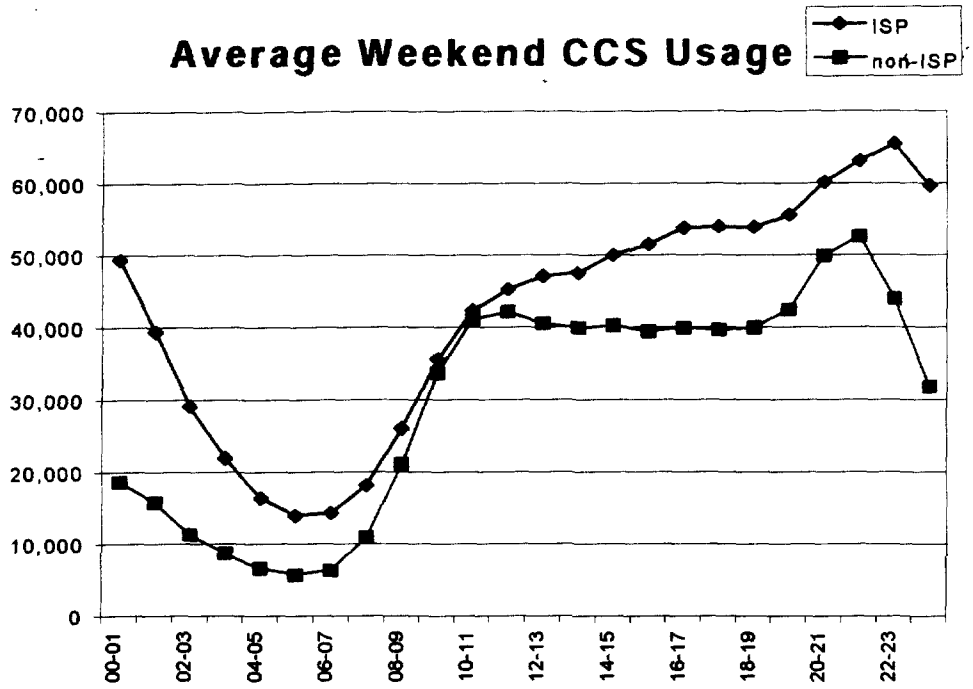
The above chart is an average over all seven days of the study. If weekend and weekdays are separated, the usage is different.

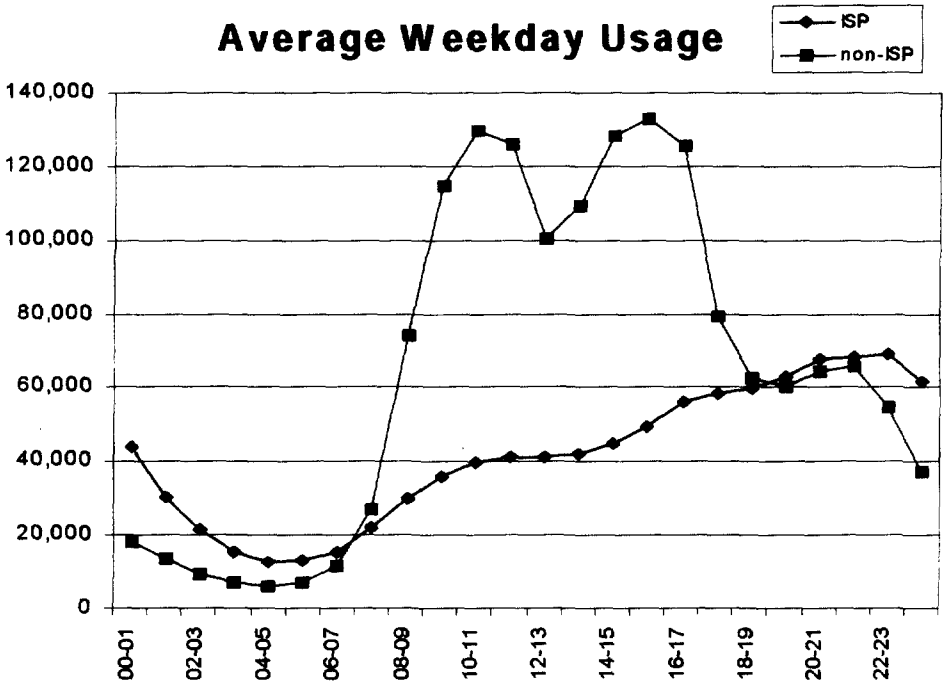
Weekdays show several features:

- High usage during early morning and late evening hours, with a peak in 9:00pm hour.
- Steady increase during working hours, with a slight plateau during the noon (lunch) hour.
- Non-ISP busy hours at 10:00am and 3:00pm.

Weekend days show several features as well:

- High usage during early morning and late evening hours, with a peak in 9:00pm hour.
- Faster increase during morning hours, continuing during day.
- Non-ISP busy hour in evening (reduced calling rates)


Average Weekend CCS Usage
ISP
non-ISP
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
00-01
02-03
04-05
06-07
08-09
10-11
12-13
14-15
16-17
18-19
20-21
22-23


Average Weekday Usage
ISP
non-ISP
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
00-01
02-03
04-05
06-07
08-09
10-11
12-13
14-15
16-17
18-19
20-21
22-23

Page 16 intentionally excluded.

APPENDIX A: DAILY REPORTS

The data from each day was collected and summarized in several tables available separately.

SUNDAY, APRIL 13, 1997

MONDAY, APRIL 14, 1997

TUESDAY, APRIL 15, 1997

WEDNESDAY, APRIL 16, 1997

THURSDAY, APRIL 17, 1997

FRIDAY, APRIL 18, 1997

SATURDAY, APRIL 19, 1997

Impacts To The PSTN From Traffic To Internet Service Providers

CC Docket No. 96-263

Usage of the Public Switched Network by Information Service and Internet Access Providers

GTE

GTE's INTERNET POSITION

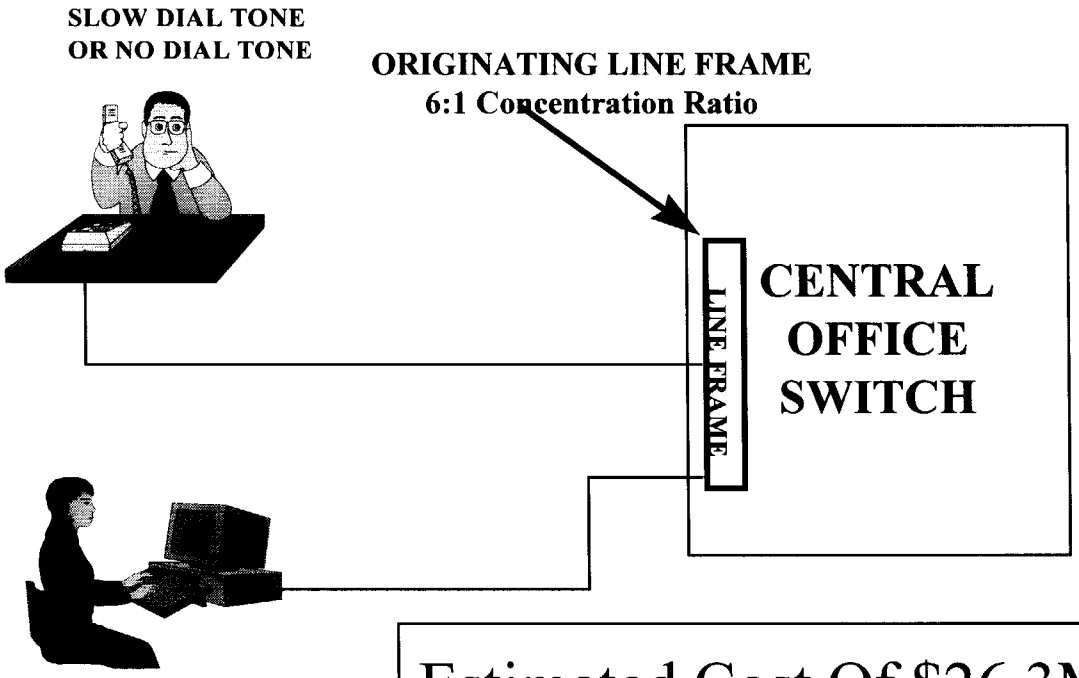
- **GTE Is Committed To The Internet Potential And Future Development**
  - **GTE Has Linked It's Future To The Internet**
  - **GTE Provides Both Wholesale And Retail Internet Services**
- **LECs Are Experiencing Major Congestion Problems That Threaten All End Users Quality Of Service**
- **Current Rules Do Not Allow For Efficient Pricing Nor Adequate Cost Recovery Which Jepordizes Future Investment Decisions**
- **FCC Must Expedite Resolution Of This Issue**

SUMMARY OF GTE's COMMENTS

- **Three Areas Of Congestion Identified**
  - **Originating Line Frames Serving End Users**
  - **Interoffice Trunking From Originating End Offices To The Office Serving Internet Service Providers(ISP)**
  - **Terminating Line Frames Serving ISPs**
- **Significant Traffic To ISPs Is Present In The GTE Network During The Daily Busy Hour**
- **Holding Time On Calls To ISPs Averaged 15-16 Minutes and Is Increasing Versus Voice Holding Time Of 3 To 4 Minutes**

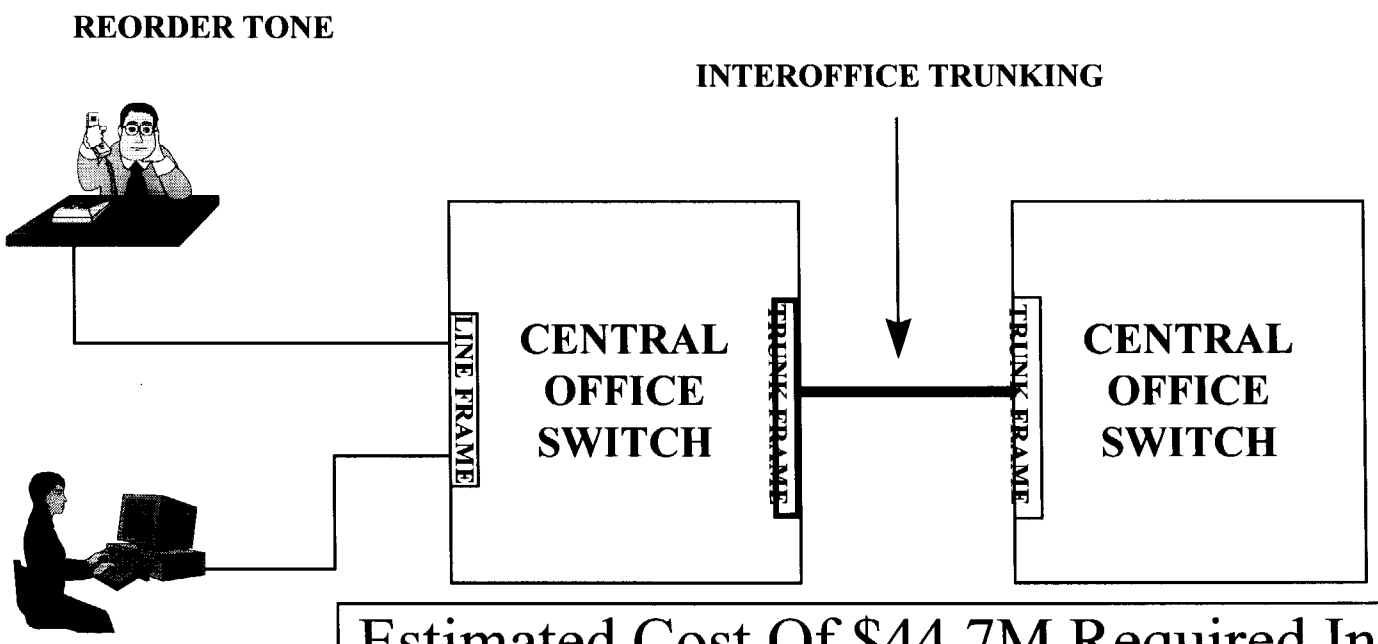
Identified Cost Impact Of $50.3M To $83.6M In 1996. Projected Cost Of $130.3M in 1997 And $181.3M In 1998.

ORIGINATING LINE FRAME CONGESTION



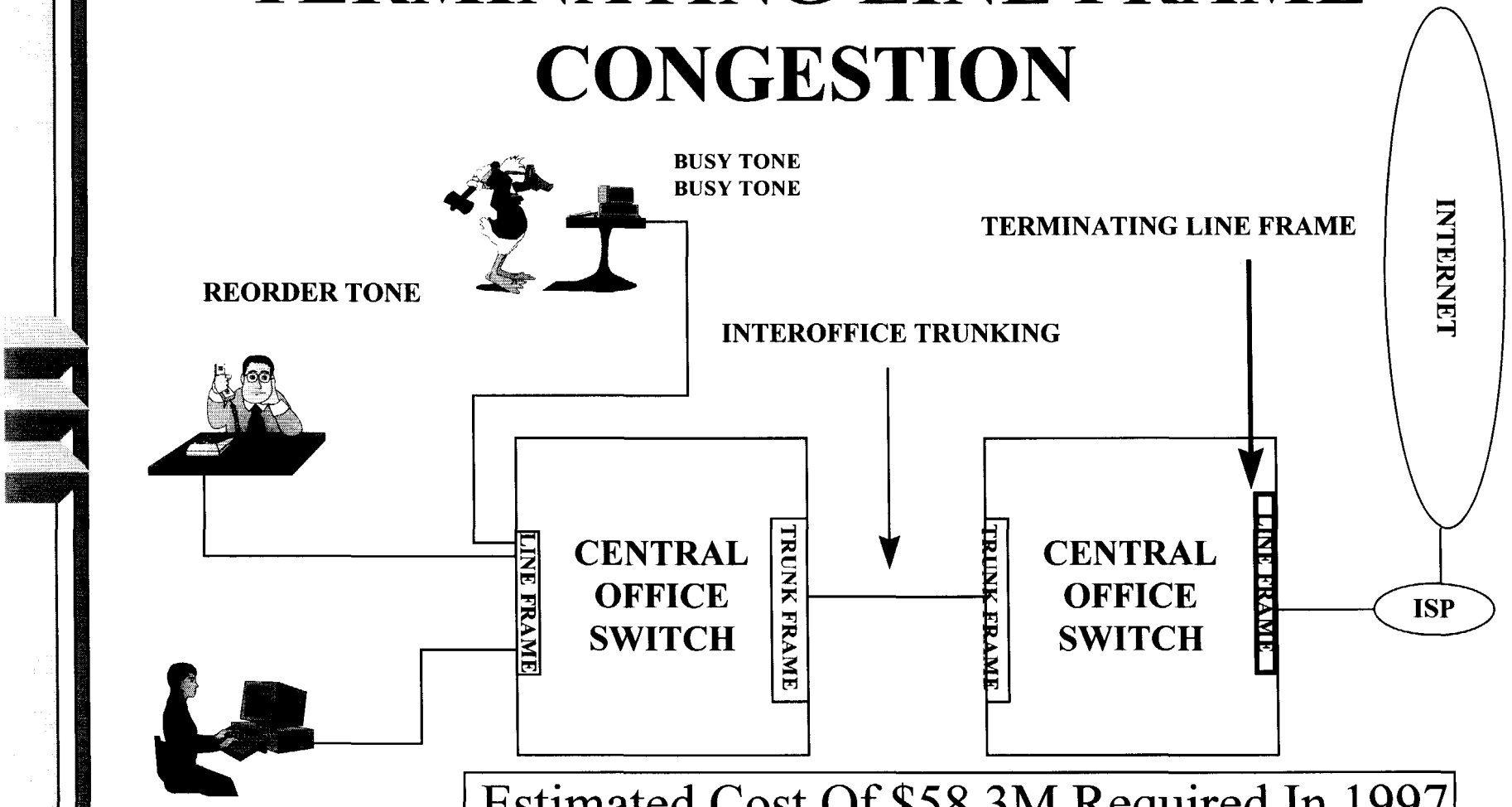
Estimated Cost Of $26.3M Required In 1997
To Accommodate Internet End User Growth

INTEROFFICE TRUNKING CONGESTION



Estimated Cost Of $44.7M Required In 1997
To Accommodate Internet Growth

TERMINATING LINE FRAME CONGESTION



Estimated Cost Of $58.3M Required In 1997
To Accommodate Internet Growth

FLORIDA STUDY

- **Hewlett Packard AccesS7 Link Monitoring System Used To Conduct Study**
  - **Studied Local Calling Network Of 23 Central Offices To 3 Hub Central Offices Serving ISPs**
  - **Study Conducted On The SS7 "A" Links Of The 3 Hub Offices**
  - **Studied Terminating Traffic Only Into The 3 Hub Offices**
  - **Traffic Data On All Terminating Calls To The 3 Offices Collected**
- **Study Conducted Over Seven Day Period (4/13/97 thru 4/19/97)**